WHAT IS CLAIMED IS:

1. A liquid discharge head comprising:

a discharge energy generating element for generating energy for discharging a liquid droplet;

an element substrate having a main surface on which said discharge energy generating element is provided;

a discharge port portion having a discharge port for discharging the liquid droplet;

a nozzle having a bubbling chamber in which a bubble is generated in liquid by said discharge energy generating element and a supply path for supplying the liquid to said bubbling chamber;

a supply chamber for supplying the liquid to said nozzle; and

an orifice substrate joined to the main surface of said element substrate;

wherein

said bubbling chamber includes a first bubbling chamber which is communicated with said supply path and uses the main surface of said element substrate as a bottom surface thereof and in which the bubble is generated in the liquid by said discharge energy generating element and a second bubbling chamber communicated with said first bubbling chamber,

said second bubbling chamber is communicated with said discharge port portion,

a central axis of a lower surface of said second bubbling chamber coincides with a center axial of an upper surface of said second bubbling chamber in a direction perpendicular to said substrate,

a sectional area of the upper surface with respect to the central axis of said second bubbling chamber is smaller than a sectional area of the lower surface with respect to the central axis of said second bubbling chamber,

the sectional area in the central axial direction is changed continuously from the lower surface to the upper surface of said second bubbling chamber, and

the sectional area of the upper surface with respect to the center axis of said second bubbling chamber is greater than a sectional area with respect to a central axis of said discharge port portion.

2. A liquid discharge head according to claim 1, wherein, regarding a side wall surface of said second bubbling chamber, a sectional area thereof in the central axis direction is changed continuously from the lower surface to the upper surface of said second bubbling chamber with inclination of 10 to 45 degrees with respect to a plane perpendicular to the main surface of said element substrate.

3. A liquid discharge head according to claim 1, wherein said first bubbling chamber is enclosed, in three directions, by nozzle walls for partitioning said plural nozzles arranged in parallel to individual nozzles and,

a wall surface of said discharge port portion is parallel with the plane perpendicular to the main surface of said element substrate.

4. A liquid discharge head according to claim 1, wherein said first bubbling chamber is enclosed, in three directions, by nozzle walls for partitioning said plural nozzles arranged in parallel to individual nozzles and,

a wall surface of said discharge port portion has taper smaller than 10°with respect to the plane perpendicular to the main surface of said element substrate.

5. A liquid discharge head according to claim 1, wherein an upper surface of said supply path parallel with the main surface of said element substrate near said supply chamber is higher than an upper surface of said supply path contiguous to and flush with an upper surface of said first bubbling chamber and is connected to the latter upper surface via a stepped portion, and

a maximum height of said supply path from the surface of said element substrate is smaller than a height from the surface of said element substrate to the upper surface of said second bubbling chamber.

6. A liquid discharge head according to claim 1, wherein a width of said supply path on a plane perpendicular to a flowing direction of the liquid is changed along a thickness direction of said orifice substrate in the vicinity of said stepped portion.

7. A liquid discharge head according to claim 1, wherein said nozzle is designed so that a sectional area of the flow path extending from said discharge port to said supply chamber is changed with plural stages.

8. A liquid discharge head according to claim 1, wherein said nozzle is formed so that a discharging direction along which the liquid droplet is flying from said discharge port becomes perpendicular to a flowing direction of the liquid flowing in said supply path.

9. A liquid discharge head according to claim 1, wherein said nozzle is formed so that the sum of volumes of said first bubbling chamber, said second

bubbling chamber and said discharge port portion becomes smaller than a volume of said supply path.

10. A liquid discharge head according to claim 1, wherein the bubble generated by said discharge energy generating element is communicated with atmosphere during the discharging.

11. A liquid discharge head according to claim 1, wherein said orifice substrate is provided with plural nozzles corresponding to the respective discharge energy generating elements and said plural nozzles are divided into a first nozzle array in which said nozzles are arranged so that longitudinal directions of said nozzles becomes in parallel and a second nozzle array which is disposed at a position opposed to said first nozzle array with the interposition of said supply chamber and in which the longitudinal directions of said nozzles becomes in parallel, and

longitudinal central axes of said nozzles in said second nozzle array are disposed with respect to longitudinal central axes of said nozzles in said first nozzle array by 1/2 of a pitch between the adjacent nozzles.

12. A method for manufacturing a liquid

discharge head comprising a discharge energy generating element for generating energy for discharging a liquid droplet, an element substrate having a main surface on which said discharge energy generating element is provided, a discharge port portion having a discharge port for discharging the liquid droplet, a nozzle having a bubbling chamber in which a bubble is generated in liquid by said discharge energy generating element and a supply path for supplying the liquid to said bubbling chamber, a supply chamber for supplying the liquid to said nozzle and an orifice substrate joined to the main surface of said element substrate, the method comprising the steps of:

coating thermal bridge type organic resin soluble by solvent and adapted to form a pattern for said first bubbling chamber and a lower portion of said supply path on said element substrate having the main surface on which said discharge energy generating element is provided and heating the resin to form a thermal bridge film;

coating organic resin soluble by solvent and adapted to form a pattern for said second bubbling chamber and an upper portion of said supply path on said thermal bridge film;

exposing and developing the organic resin by using Near-UV light having a wavelength of 260 to 330

nm in order to form the pattern for said second bubbling chamber and the upper portion of said supply path;

forming inclination of 10 to 45 degrees by heating the exposed, developed and pattern-formed organic resin at a temperature smaller than a glass transition point;

exposing and developing said thermal bridge film by using Deep-UV light having a wavelength of 210 to 330 nm;

laminating said orifice substrate having a discharge port by coating, exposing, developing and heating negative type organic resin on a flow path pattern formed by the two-layer soluble films; and

forming said discharge port portion for discharging the liquid droplet, said nozzle having said bubbling chamber in which the bubble is generated in liquid by said discharge energy generating element and said supply path for supplying the liquid to said bubbling chamber, said supply chamber for supplying the liquid to said nozzle and said orifice substrate joined to the main surface of said element substrate, by illuminating Deep-UV light onto said two-layer flow path forming organic resins formed on said lower layer via said orifice substrate thereby to remove the resins by solvent.

13. A method according to claim 12, wherein said second bubbling chamber and the upper portion of said supply path are formed by pattern transferring, by using a photo-mask in which a pattern of said second bubbling chamber is a normal resolving power pattern of the organic resin and a pattern of the upper portion of said supply path is a pattern smaller than limited resolving power of the organic resin and by using Near-UV light having a wavelength of 260 to 330 nm.

14. A method according to claim 12, wherein the formation of said second bubbling chamber and the upper portion of said supply path is divided into an area where the resin is removed completely, an area where the resin is removed partially and an area where the resin is not removed at all in said exposing and developing step of the organic resin.

15. A method according to claim 14, wherein, in said exposing and developing step of the organic resin, said area where the resin is not removed at all forms said second bubbling chamber and said area where the resin is removed partially forms the upper portion of said supply path.

16. A method according to claim 12, wherein a

height of said first bubbling chamber on said element substrate is 5 to 20 μm and is formed with inclination of 0 to 10°with respect to a plane perpendicular to the main surface of said element substrate.

17. A method according to claim 12, wherein the thermal bridge type organic resin for forming said first bubbling chamber and said supply path mainly includes methyl methacrylate and is formed by dissolving material obtained by being copolymerized with methacrylic acid and methacrylic acid ester into coating solvent.